in.xm

Mid-range spa pack platform

Troubleshooting guide

So advanced!
It's like walking on water!

Aeware 3

Preliminary Pre-Release Version

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Most rugged spa pack platform ever developed for spa and hot tub manufacturers.

Our new and innovative in.xm spa pack platform includes all the features and functions you need in a stunning new power box design that sets new standards with its superb combination of looks and functionality.

With its waterproof enclosure & breakthrough connectors, in.xm boasts the highest water resistance ever designed in a pack, just one of a long list of innovative features that make in.xm the safest and most reliable spa pack platform ever offered to the industry.

Versatile and heater-"less", in.xm can be wall-mounted or installed on its mounting base and comes with a perfect companion, our new in.therm intelligent remote water heating system.

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Form truly follows function in this system packed with innovative built-in features and ground-breaking flexibility.

WARNINGS:

Before installing or connecting the unit, please read the following.

* FOR UNITS FOR USE IN OTHER THAN SINGLE-FAMILY DWELLINGS, A CLEARLY LABELED EMERGENCY SWITCH SHALL BE PROVIDED AS PART OF THE INSTALLATION. THE SWITCH SHALL BE READILY ACCESSIBLE TO THE OCCUPANTS AND SHALL BE INSTALLED AT LEAST 5 FEET (1.52 M) AWAY, ADJACENT TO, AND WITHIN SIGHT OF THE UNIT.

* ANY DAMAGED CABLE MUST BE IMMEDIATELY REPLACED.

* TURN POWER OFF BEFORE SERVICING OR MODIFYING ANY CABLE CONNECTIONS IN THIS UNIT.

* TO PREVENT ELECTRIC SHOCK HAZARD AND/OR WATER DAMAGE TO THIS CONTROL, ALL UNUSED RECEPTACLES MUST HAVE A DUMMY PLUG.

* THIS CONTROLLER MUST NOT BE INSTALLED IN PROXIMITY OF HIGHLY FLAMMABLE MATERIALS.

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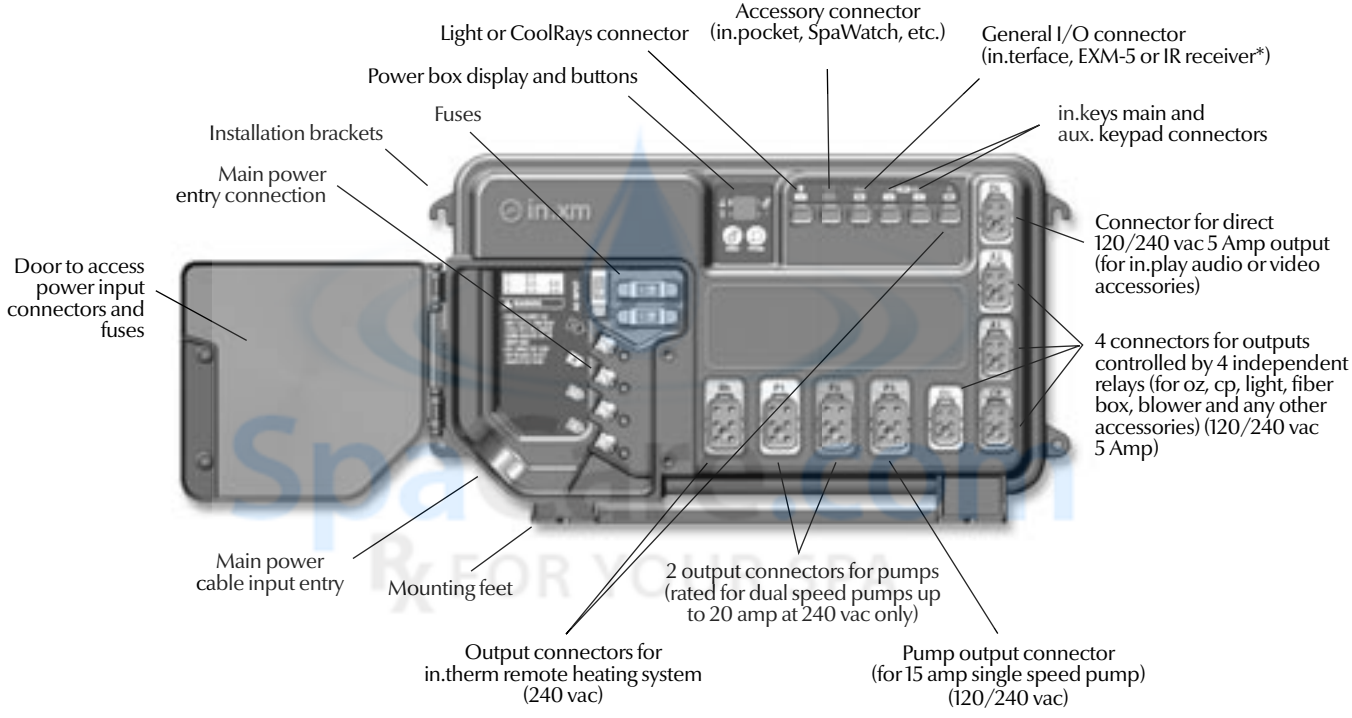
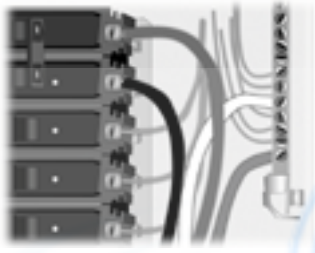
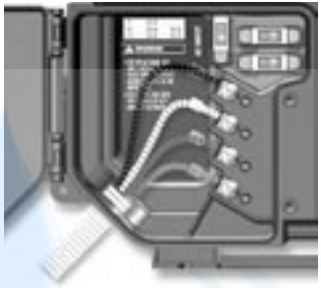

Light or CoolRays connector
Accessory connector (in.pocket, SpaWatch, etc.)
General I/O connector (in.terface, EXM-5 or IR receiver*)
Power box display and buttons
Fuses
Installation brackets
in.keys main and aux. keypad connectors
Main power entry connection
Connector for direct 120/240 vac 5 Amp output (for in.play audio or video accessories)
Door to access power input connectors and fuses
4 connectors for outputs controlled by 4 independent relays (for oz, cp, light, fiber box, blower and any other accessories) (120/240 vac 5 Amp)
Main power cable input entry
Mounting feet
2 output connectors for pumps (rated for dual speed pumps up to 20 amp at 240 vac only)
Output connectors for in.therm remote heating system (240 vac)
Pump output connector (for 15 amp single speed pump) (120/240 vac)

* IR receiver available on every LV connection except LI and RH

Main electrical box

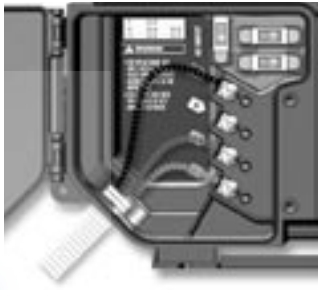


GFCI panel



For 240 VAC (4 wires)

Correct wiring of the electrical service box, GFCI, and pack terminal block is essential. Call an electrician if necessary.



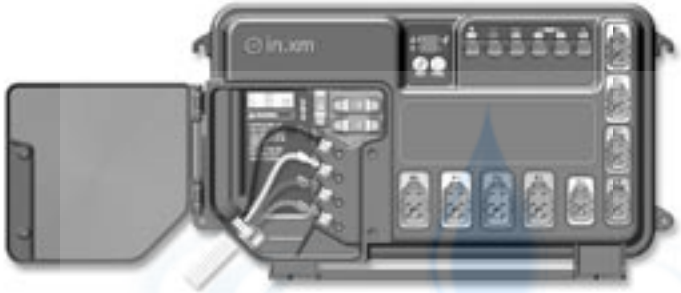
For 240 VAC (*3 wires)

*If connected to a 3 wire system, no 120 VAC component will work.

Warning!

"For units for use in other than single-family dwellings, a clearly labeled emergency switch shall be provided as part of the installation. The switch shall be readily accessible to the occupants and shall be installed at least 5 feet (1.52 m) away, adjacent to, and within sight of the unit".

Electrical wiring



Warning!

This product must always be connected to a circuit protected by a ground fault interrupter.

Proper wiring of the electrical service box, GFCI and in.xm terminal block is essential!

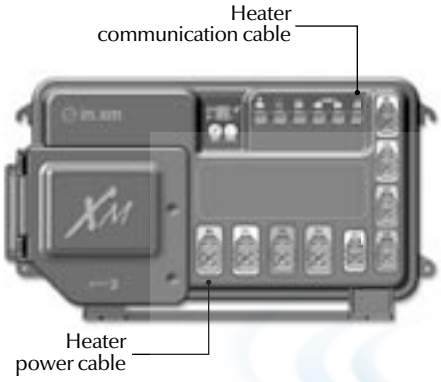
Check your electrical code for local regulations. Only copper wire should be used, never aluminum.

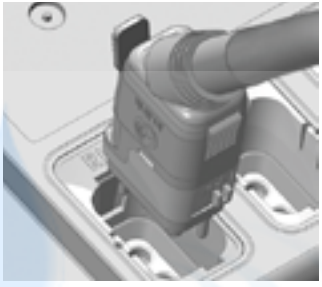
To install the wiring for the in.xm spa control, you'll need a Phillips screwdriver, a 9/16" nut driver or a flat screwdriver.

Loosen the 2 screws of the spa pack door and open it. Remove 8" of cable insulation. Strip away 1" of each wire insulation. Pull the cable through the cutout of the box and secure it with a strain relief (trade size 1" strain relief; hole diameter: 1.335"). Make sure that only the uncut sheathing is clamped at this opening. Push the color-coded wires into the terminals as indicated on the sticker and use the 9/16" wrench or flat screwdriver to tighten the bolts on the terminals.

After making sure wire connections are secure, push them back into the box and close the door. Tighten the 2 screws of the spa pack door.

Connect the bonding conductor to the bonding lug on the left side of the in.xm spa pack (a grounded electrode conductor shall be used to connect the equipment grounding conductors).





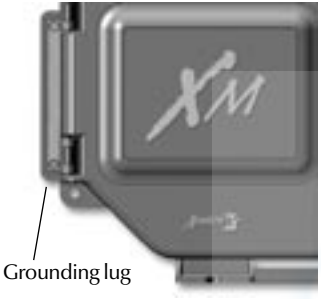
in.link connectors

In.xm features in.links connectors with colored and tag polarizers. This new plug and connector technology has been specifically designed for easy and safe assembly. The tags are interchangeable depending on the output; the polarizers are designed to avoid misconnections.

In.link connectors are easily and conveniently accessible from the front of the pack offering a wide range of possible connection configurations. In.link connectors come in 3 sizes (HC, LC and low voltage) for all types of inputs and output devices.

They all include an integrated latch that keeps them safely in place and provides audible and tactile feedback when properly connected.

Finally, colored and tag polarizers provide a definite advantage in reducing SKU numbers and inventory levels thus giving OEMs and dealers total flexibility to easily configure output devices.



Make sure all accessories are linked to the bonding connector and connected to pack.

Make sure the spa pack door is closed.

Turn on the breaker.

Press **Select** button to change breaker setting.

The in.scan display will show the breaker setting menu.

It is important to specify the current rating of the GFCI used to insure a safe and efficient current management (and no GFCI trippings).

Br values displayed by the system correspond to 0.8 of the maximum amperage capacity of the GFCI.

GFCI	Br
60 Amp	48 Amp
50 Amp	40 Amp
30 Amp	24 Amp

Note: Every OEM has its own preset configurations.

Use **Change** button to set the current breaker rating then press **Select** button.

All receptacles will match the corresponding female connection on the spa pack. No connectors should remain unplugged. Use blank plugs to fill unused connectors.

Setting the learning mode

The in.xm pack has the ability to verify and "learn" the current consumption of every output connected to it. If an output is replaced, a new learning must be done. Follow these simple steps:

Press and hold **Select** button for 5 seconds to activate low level programming. Once activated, the display shows “LL” and, in succession, the current preset low level configuration selected.

Press **Change** button repeatedly to select the the same preset low level configuration again.

Press **Select** to confirm. You will exit menu automatically. The in.xm will then reset. After resetting, the system starts a "learning sequence" in which each individual output is activated and its peak current displayed and saved.

Note: if unusual current readings i.e.: 4 to 6 amps are detected on the high speed of any pump, all pumps must be primed and the learning mode should be restarted.

Description

Select button is used to access the breaker setting menu (short press) as well as the low level pro-gramming menu (Press and hold for 5 seconds). Subsequent presses will save changes and display the next option available or exit automatically if it was the last one.

Use **Change** button to change the parameters displayed.

Breaker ratings

Press **Select** button once to activate the breaker setting menu. Once activated, the display shows "br" and, in succession, the maximum current rating of the breaker.

Press **Change** button to change setting.

Press **Select** to confirm. You will exit menu automatically (in.xm will also reset).

Note: this procedure has to be performed after every learning mode.

Note: Every OEM has its own preset configurations.

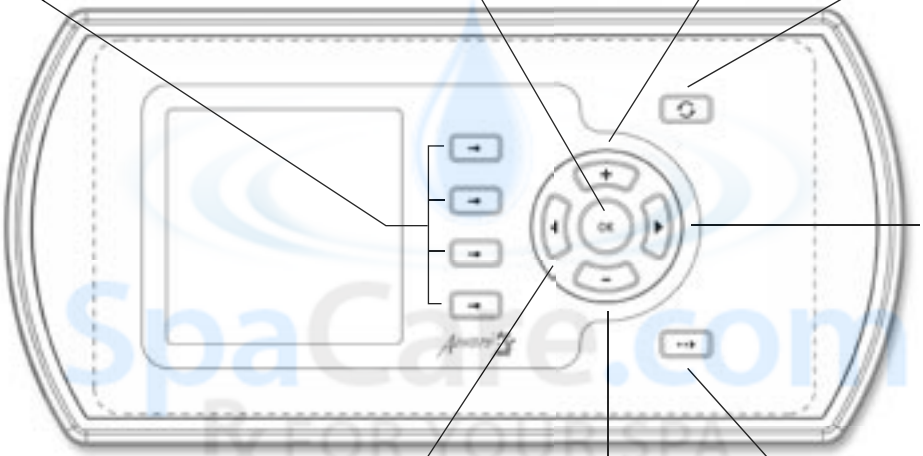
Multifunction Keys **1**, **2**, **3**, **4**

Each of these four keys helps you to select and/or execute the indicated function displayed on the screen in any given window. In this way, the task performed by a given multifunction key will vary depending on the menu or window.

"**Ok**" Key

"**Plus**" Key increases parameter setting

"**Mode**" Key selects mode of operation: Spa, Audio, and Options. Also, it allows you to exit any programming window without saving any changes and go back to the previous screen.



"**Right**" Multifunction Key

"**Left**" Multifunction Key

"**Minus**" Key decreases parameter setting

"**Next**" Key goes to next menu page

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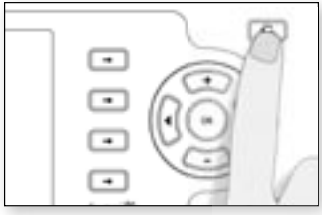

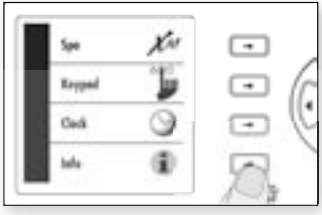

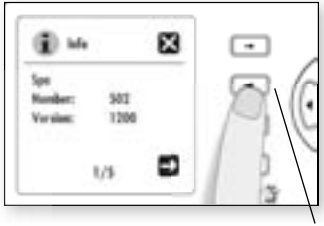

Multifunction key 2

Spa Mode

- Press **Mode** key ↻ to display the mode selection window.
- Select **Options** menu
- Select **Info** sub-menu
- Press and hold **Multifunction Key 2** for 5 seconds to access **Tech menu** (see next page)

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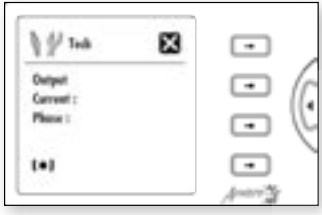
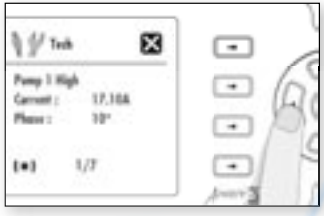
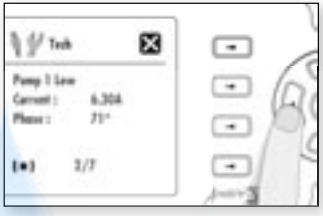
** Option available with in.k600 keypad only.*







Tech Menu

This menu allows you to view the speed (low or high in the case of the pumps), learned amperage data as well as the phase angle for each output.

Note:

If __ appears on any screen, it means that no significant current has been detected and "learned" by the system for that output.

Here Pump 1 high speed current and phase angle are displayed

- Use **Right** key to go to the next screen menu.

Here Pump 1 low speed current and phase angle are displayed

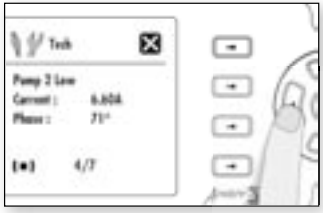
- Use **Right** key to go to the next screen menu.

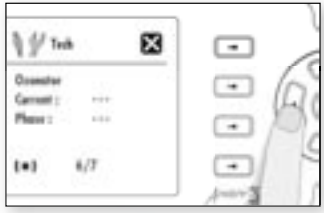
Here Pump 2 high speed current and phase angle are displayed

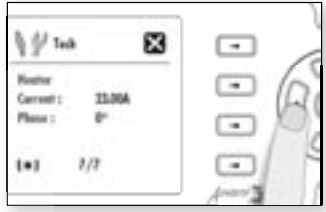
- Use **Right** key to go to the next screen menu.

Note:

Use **Right** key to go to next screen menu.
Use **Left** key to go back to previous screen menu.
Use **Ok** key or Select the ☒ option to go back to the initial screen on the Tech menu.







Tech Menu

Here Pump 2 low speed current and phase angle are displayed

- Use **Right** key to go to the next screen menu.

Here Fan current and phase angle are displayed

- Use **Right** key to go to the next screen menu.

Here Ozonator current and phase angle are displayed

- Use **Right** key to go to the next screen menu.

Here Heater current and phase angle (0°) are displayed

- Use **Right** key one last time to go back to keypad main menu.

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in.xm troubleshooting advantage

in.xm unique troubleshooting features are called in.scan because in.xm has the capacity to scan itself and read the status of all exterior connected devices.

All errors codes will be displayed on the keypad and on the in.xm display, making reading codes easier and more convenient.

Error codes

Error codes indicate a failure condition or a problem which needs to be corrected to ensure proper functioning of the system. Both the error code and device identification are alternatively displayed.

Note: Every OEM has its own preset configurations.

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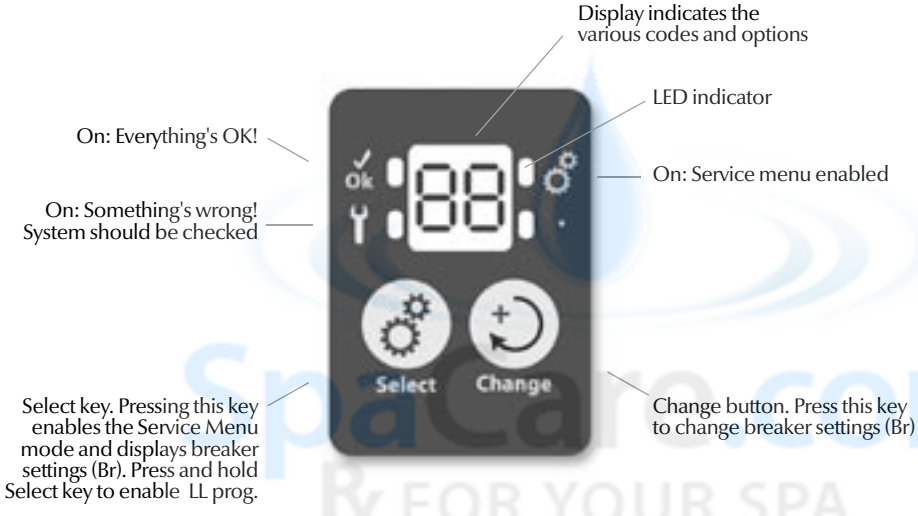
Display indicates the various codes and options
LED indicator
On: Everything's OK!
On: Service menu enabled
On: Something's wrong! System should be checked
Ok
Select
Change
Select key. Pressing this key enables the Service Menu mode and displays breaker settings (Br). Press and hold Select key to enable LL prog.
Change button. Press this key to change breaker settings (Br)

Error Codes

When displaying errors codes, both device ID and related error code are displayed in alternance. If there is more than one active error, the one with the highest priority is displayed. If problems are found on several devices, the priorities are as follows:

- in.xm (error “SP” for spa pack)
- in.therm (error “RH” for remote heater)
- high voltage devices accessories (P1, P2, P3...)

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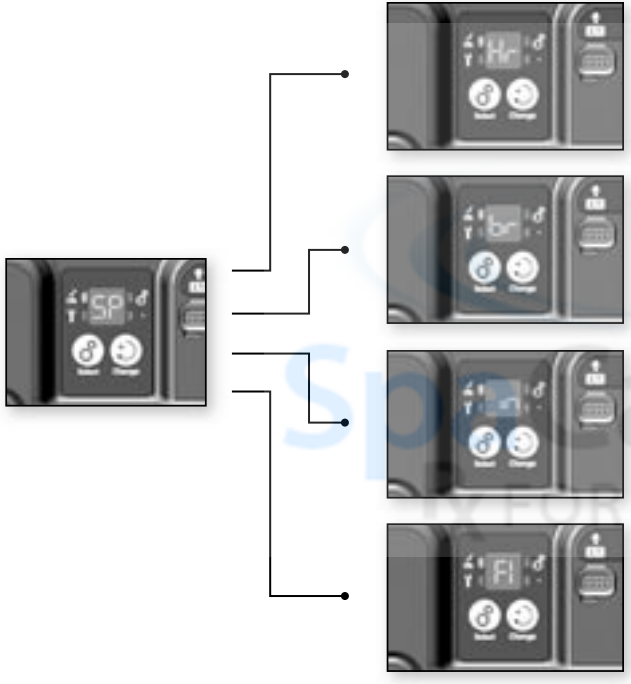
SP error codes



SP - HR

An internal hardware error has been detected in in.xm.

SP - BR

The chosen input current rating is lower than the sum of current for all pumps.

SP - IN

The input voltage is too low.
Either there is a problem with the terminal connections or with the power lines.

SP - FI

in.xm Fuse FI is blown.
Fan, blower, circulation pump, fiber optic

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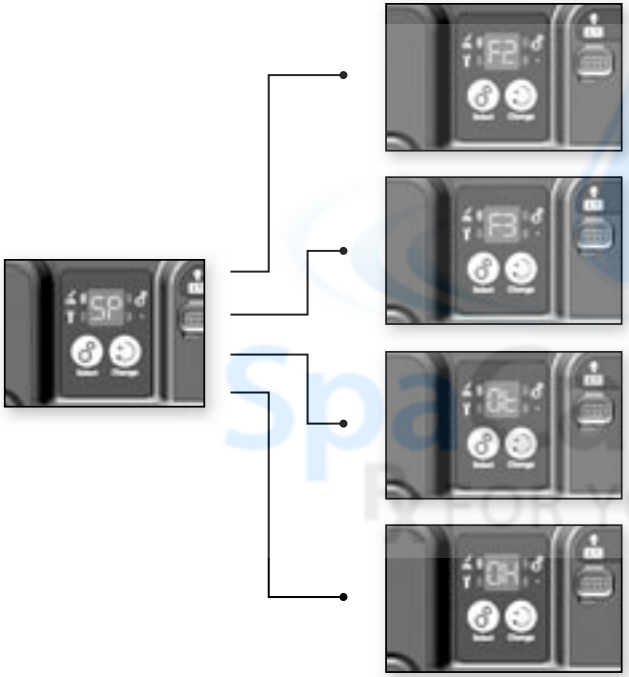

SP - F2

in.xm Fuse F2 is blown.
Pump 2, Pump 3 or blower that is more than 5 amp

SP - F3

in.xm Fuse F3 is blown.
Pump 1

SP - OT

Temperature inside the spa skirt is too high, causing the internal temperature in the in.xm to increase above normal limits (overheat condition).

SP - OH & blinking temperature higher than 112 °F on the keypad display

The system detects spa water temperature exceeding 112 °F (overheat condition).

SP - HR

- Restart the spa pack and start & stop all pumps and blower.
- If error reappears, replace in.xm spa pack.

SP - BR

- Increase in.xm current rating and breaker setting.
- Increase breaker size and manufacturer's cable gage or reduce pump size.

SP-Br is not considered an error code, therefore it doesn't trigger the service icon to appear on display. Although SP-Br should be viewed more as a warning, it won't allow the heater or any other accessory to come on if the amperage available is not adequate for the requirements.

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SP - IN

- Check input terminal connections to make sure they are correctly wired & tighten (see connection
- Have a certified electrician verify the quality of the power lines.

  You should have 240v between L1 & L2 and 120v between each line and neutral.

SP - F1

- Replace the blown fuse F1 with an identically rated replacement (SC-20, SC-25, etc.)
- If new fuse blows, disconnect fan, blower, circulation pump & fiber optic.
- Replace fuse and reconnect all components, one at a time, until fuse blows.
- Replace component that caused fuse to blow.

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SP - F2

- Replace the blown fuse F2 with an identically rated replacement (SC-20, SC-25, etc.)
- If new fuse blows, disconnect pump 2, pump 3 or blower.
- Replace fuse and reconnect all components, one at a time, until fuse blows.
- Replace component that caused fuse to blow.

SP - F3

- Replace the blown fuse F3 with an identically rated replacement (SC-20, SC-25, etc.)
- If new fuse blows, Replace pump 1.

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SP - OT

- Remove spa skirt and let system cool down.
- A breaker reset may be required to clear error.

SP - OH & blinking temperature higher than 112 °F on the keypad display

- Remove spa cover and let spa cool down.
- Add cold water and lower filter cycle.
- If error persists, measure the temperature with a DIGITAL thermometer and compare its reading with temp. on the display. If temp. reading is different, replace in.therm.
- If problem persists replace pack.

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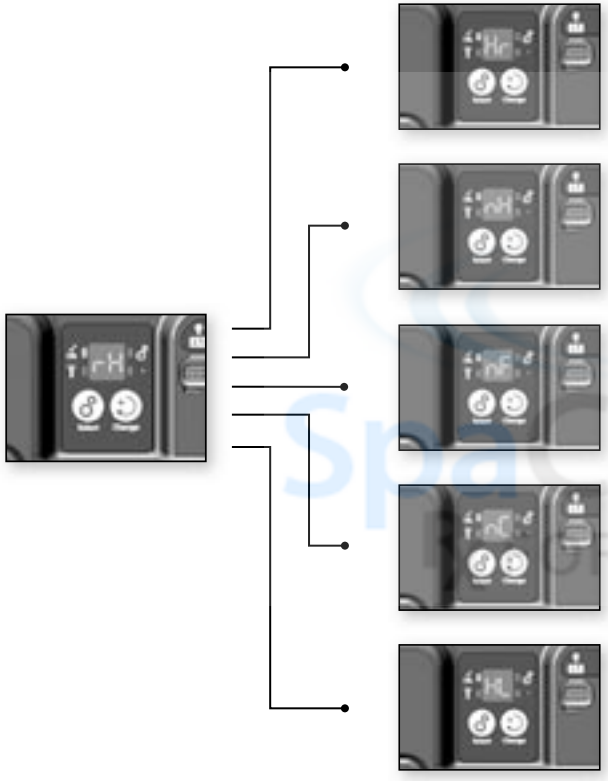
RH error codes



RH - HR

An hardware error was detected in in.therm (related to the electronic circuit only).

RH - NH

This error occurs if in.therm is trying to heat water but does not detect any increase in temperature.

RH - NF

This code is displayed when a “no flow” condition is detected by in.therm.

RH - NC

Communication problem exists between in.xm and in.therm.

RH - HL

High Limit hardware circuit tripped.

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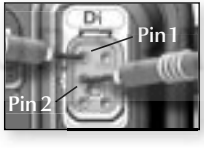
RH - HR

- Reset main breaker; make sure the heater restarts by changing set point and turning every output On and Off (Pumps).
- If problem isn't corrected, replace in.therm.

RH - NH

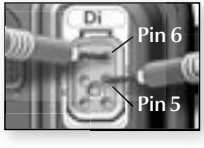
- Verify if in.therm is properly connected. (You should hear a click!)
- Reset main breaker.
- Mesure voltage directly on the Di connector (see illustration). You should read:

240VAC at Di connector: Pin 1 & Pin 2



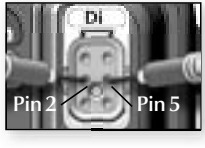
or

120VAC at Di connector: Pin 5 & Pin 6



or

120VAC at Di connector: Pin 5 & Pin 2



Note: 240VAC at Di connector will be the only reading possible if the installation doesn't have the neutral wire.

- If you don't get proper voltage readings, reset the main breaker.
- If you get an appropiate voltage reading, replace in.therm.

RH - NF

- Make sure water valves are open and that water level is high enough.
- Check and clean filters.
- Make sure there are no air locks (or that no object obstructs the passage of water in the in.therm channel). Pumps may make strange noises and error messages such as “P1 ER” could appear.

  Follow air lock procedure to clear them.
- Make sure that the pump associated to the heater (Pump #1) is running by pressing P1 key.

  If “P1 ER” appears on display, go to Pump 1 error section and follow procedure.

RH - HL high limit hardware circuit tripped.

There are 2 possible causes:

- The heater was previously stored in a very hot location prior to installation and there is no water yet in its tube to cool it down.

  -Use a hose to cool down the interior of the tube.
- External ambient temp. is high enough to heat the water, even though the pumps remain off.

  -Add cold water in spa and let heater cool down.

  -Reset spa pack using current breaker.

RH - NC

- Make sure remote heater cables are connected properly and that none of the cable connector pins are bent.

  If problem persists, either the in.xm or the in.therm may need to be replaced (both parts must be returned since either part could be defective).

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High voltage devices/accessories (P1, P2, P3..)

P1 - ER

System hasn't detected any current change when turning Pump 1 on or off

P2 - ER

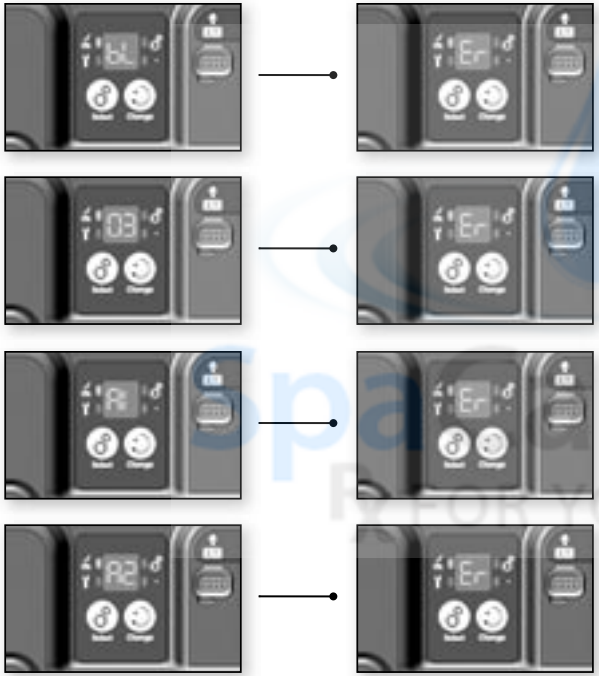
System hasn't detected any current change when turning Pump 2 on or off

P3 - ER

System hasn't detected any current change when turning Pump 3 on or off

CP -ER

System hasn't detected any current change when turning circ. pump on or off



BL - ER

System hasn't detected any current change when turning blower on or off

O3 - ER

System hasn't detected any current change when turning ozonator on or off

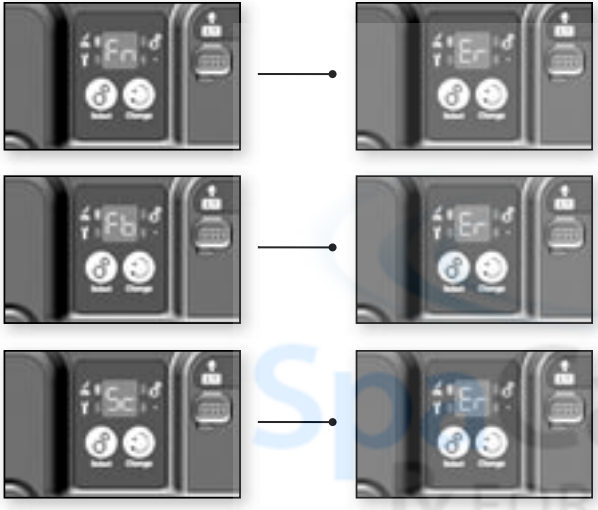
A1 - ER

System hasn't detected any current change when turning Aux. 1 on or off

A2 -ER

System hasn't detected any current change when turning Aux. 2 on or off

Spa Parts .com
PARTS FOR YOUR SPA



FN - ER

System hasn't detected any current change when turning fan on or off

FB - ER

System hasn't detected any current change when turning fiber box on or off

SC - ER

System learning error

Spaware.com
FOR YOUR SPA

P1 - ER

- Make sure Pump 1 is connected properly (when connecting plug, you should hear it click).
- Manually change output status (on/off) of Pump 1 and cycle through all possible states (i.e. low, high, off).
- Reset spa pack by pressing Select key twice.
- If error does not clear, problem is most likely with Pump 1. It will need to be replaced.
- If Pump 1 is replaced, a new learning routine must be performed (see procedure page 12).

P2 - ER

- Make sure Pump 2 is connected properly.
- Manually change output status (on/off) of Pump 2 and cycle through all possible states (i.e. low and high speeds). Reset spa pack.
- If error does not clear, problem is probably with Pump 2. It will need to be replaced.
- If Pump 2 is replaced, a new learning routine must be performed (see procedure page 12).

Note:

- If a pump error is detected during a check flow, the pump will remain activated while performing this task, for this reason, a 9 min. delay might be required to clear error.
- If the spa is equipped with an in.k600 the current learned can be verified (see viewing current management data section for more details). Furthermore, if the current value learned by the in.xm spa control is not appropriate, it can trigger a false P1-ER error code.

P3 - ER

- Make sure Pump 3 is connected properly.
- Manually change output status (on/off) of Pump 3.
- Reset spa pack.
- If error does not clear, problem is probably with Pump 3. It will need to be replaced.
- If Pump 3 is replaced, a new learning routine must be performed (see pages 9 & 12).

CP - ER

- Make sure Circ. Pump is connected properly.
- Manually change output status by changing set point.
- Reset spa pack.
- If error does not clear, problem is probably with CP. It will need to be replaced.
- If the CP is replaced, a new learning routine must be performed (see pages 9 & 12).

Note: If the spa is equipped with an in.k600 the current learned can be verified (see viewing current management data section for more details). Furthermore, if the current value learned by the in.xm spa control is not appropriate, it can trigger a false P1-ER error code.

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BL - ER

- Make sure blower is connected properly.
- Manually change the output status (on/off) of blower.
- Reset spa pack.
- If error does not clear, problem is probably with blower, it will need to be replaced.
- If blower is replaced, a new learning routine must be performed (see pages 9 & 12).

O3 - ER

- Make sure ozonator is connected properly.
- Manually change the output status (on/off) of ozonator.
- Reset spa pack.
- If error does not clear, problem is probably with the ozonator, it must be replaced.
- If the ozonator is replaced, a new learning routine must be performed (see pages 9 & 12).

Important: If the ozonator doesn't draw more than 400 ma, the O3-ER error will not be displayed even if the ozonator is defective.

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A1 - ER

- Make sure Aux. 1 device is connected properly.
- Manually change the output status (on/off) of Aux. 1 device.
- Reset spa pack.
- If error does not clear, problem is probably with the Aux. 1 device, it must be replaced.
- If Aux. 1 is replaced, a new learning routine must be performed (see pages 9 & 12).

A2 - ER

- Make sure Aux. 2 device is connected properly.
- Manually change the output status (on/off) of Aux. 2 device.
- Reset spa pack.
- If error does not clear, problem is probably with the Aux. 2 device. Must be replaced.
- If Aux. 2 is replaced, a new learning routine must be performed (see pages 9 & 12).

Important:

- If the Aux. 1 device doesn't draw more than 400 ma, the A1-ER error will not be displayed even if the Aux. 1 device is defective.
- If the Aux. 2 device doesn't draw more than 400 ma, the A2-ER error will not be displayed even if the Aux. 2 device is defective.

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FN - ER

- Make sure fan is properly connected.
- Manually change the output status (on/off) of fan.
- Reset spa pack.
- If error does not clear, problem is probably with the fan. It will need to be replaced.
- If the fan is replaced, a new learning routine must be performed (see pages 9 & 12).
- Replace ozonator par Fan.

FB - ER

- Make sure fiber box is properly connected.
- Manually change output status (on/off) of fiber box and cycle through all possible states (i.e. low and high intensities).
- Reset spa pack.
- If error does not clear, problem is probably with the fiber box. It will need to be replaced.
- If the fiber box is replaced, a new learning routine must be performed (see pages 9 & 12).

Important:

- If the fan doesn't draw more than 400 ma, the FN-ER error will not be displayed even if the fan is defective.
- If the fiber box device doesn't draw more than 400 ma, the FB-ER error will not be displayed even if the fiber box device is defective.

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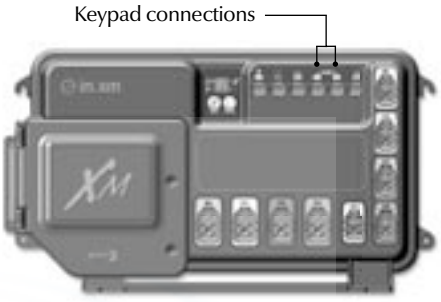
SC - ER - System learning error

Every time a low-level option is changed, system must "learn" currents associated to each output/load. During this learning process, the device connected to Di (direct output, no relay) must be disconnected IF IT DRAWS MORE THAN 0.4 AMP. If it isn't, system will report an SC error code.

- Disconnected load.
- Restart learning process by pressing Select key for 5 sec.
- Press Change key as many times as necessary to go through all low level programming settings (see low level programming section).
- When process done, the accessory connected to Di can be reconnected.

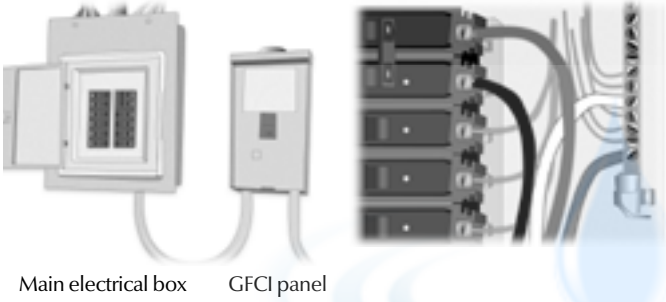


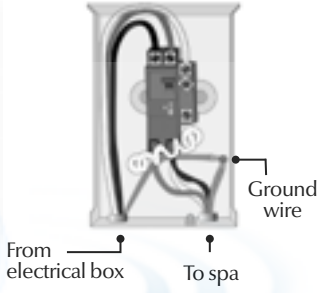
Keypad doesn't seem to work!

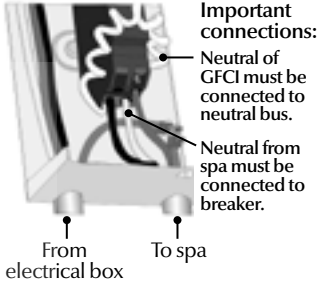
Note: Keypad connected to in.xm is only detected when main breaker is resetted. Don't forget to reset breaker if you're changing keypad model (in.k400 for in.k600).

If a keypad doesn't seem to work:

- Verify keypad connections and try spare keypad.
- Replace keypad if problem is corrected.
- Replace in.xm if problem is not corrected.






Important connections:
Neutral of GFCI must be connected to neutral bus.
Neutral from spa must be connected to breaker.
From electrical box
To spa

Warning!

There are different GFCI models used on the market.
See manufacure's instructions that come with the GFCI for specific information. Note that all illustrations are examples only.

Verify if GFCI is properly connected.

If it's not, verify GFCI diagram and reconnect it.

Verify in.xm pack wiring (make sure that the neutral and the ground have not been inverted).

If the GFCI is properly connected but still tripping, unplug all outputs from the spa pack (pumps, heater, ozonator etc).

Reconnect one output at the time until the GFCI trips again.

Replace defective component.

Note: If the neutral of the GFCI is hooked up to the neutral bar, the in.xm spa control will only trip when the 120v outputs are fired (i.e.: the ozonator)

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